

Using Fluorescent *in Situ* Hybridization (RNA-FISH) to quantify mRNAs in individual *Saccharomyces cerevisiae*



Master Thesis

Motivation

RNA plays an important role in both the transcription and translation processes. Unlike bacteria, in eukaryotes, RNA will be transported, localized, and locally translated. Therefore, it is meaningful to detect the localization and quantify the RNA. RNA-FISH is one of the most popular methods to quantify and localize RNA in fixed cells. For this reason, we would like to establish the RNA detection in *Saccharomyces cerevisiae* using fluorescence *in situ* hybridization (FISH).

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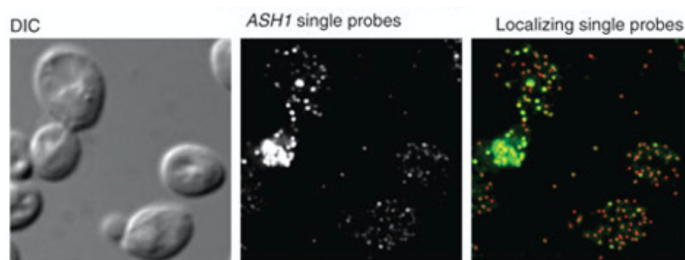


Figure. Single ASH1 mRNA and FISH probe quantification [2]

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Goals

This master thesis focuses on establishing the RNA detection in *Saccharomyces cerevisiae* using fluorescence *in situ* hybridization. It will be a challenge to explore the localization and quantify the RNA during the data analyse and further compare it with *in vivo* data.

Prerequisites

- Experience with cell biological working techniques, ideally experience in imaging
- Independent working ability
- Fluent English language skills in both reading and writing, German language skills beneficial

Contact for applications

Applications (including CV) should be sent in electronic form only, summarised in a single overall pdf document to yujie.zhong@bcs.tu-darmstadt.de.



Reference

- [1] Huber D, Voith von Voithenberg L, Kaigala G V. Fluorescence in situ hybridization (FISH): History, limitations and what to expect from micro-scale FISH *Micro Nano Eng.* 2018;1:15-24. doi:<https://doi.org/10.1016/j.mne.2018.10.006>
- [2] Trcek T, Chao JA, Larson DR, Park HY, Zenklusen D, Shenoy SM, Singer RH. Single-mRNA counting using fluorescent in situ hybridization in budding yeast. *Nat Protoc.* 2012 Feb 2;7(2):408-19. doi: 10.1038/nprot.2011.451. PMID: 22301778; PMCID: PMC4112553.
- [3] Sanderson MJ, Smith I, Parker I, Bootman MD. Fluorescence microscopy. *Cold Spring Harb Protoc.* 2014;2014(10):pdb.top071795-pdb.top071795. doi:10.1101/pdb.top071795